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# USSR Report

ENERGY

No. 100



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## CONTENTS

## ELECTRIC POWER

Infrastructure Review at Ukrainian Electric Power Stations (S. Prokopchuk; TRUD, 12 Jan 82) .....	1
Ekibastuz Construction Report (V. Ovchinnikov; STROITEL'NAYA GAZETA, 22 Jan 82) .....	4
Lenenergo Operation Described (A. Berezkin; VECHERNIY LENINGRAD, 6 Feb 82) .....	8
Baypazinskaya GES Turnkey Experiment (A. Nemirovskiy; KOMMUNIST TADZHIKISTANA, 10 Feb 82) ..	10
Petropavlovsk TETs-2 Not Operating at Full Capacity (A. Raysh; KAZAKHSTANSKAYA PRAVDA, 11 Feb 82).....	14
Accelerated Completion of Power Projects Called For (VYSHKA, 12 Feb 82) .....	19
Yermakovskaya GRES Power Output Lagging (V. Stupak; KAZAKHSTANSKAYA PRAVDA, 13 Feb 82) .....	22
Unsatisfactory Production Figures Cited (KAZAKHSTANSKAYA PRAVDA, 14 Feb 82) .....	26
Briefs	
More on Kurpsayskaya GES	27
Transformer for the Kolymskaya GES	27
Geothermal Power Station in Stavropol'	28
Kiev TETs-6 Progress Report	28
Permskaya GRES Progress Report	28
More on the Permskaya GRES	28
Nurek Power Line	29
Power for West Siberia	29
LEP-1150 Ekibastuz to the Urals	29

## FUELS

Deep Oil and Gas Drilling in Azerbaijan Outlined (K. Kerimov; VYSHKA, 19 Feb 82) .....	30
Turkmen Gas Workers Continue Intensive Work (S. Gochiyayev; SOVETSKAYA KIRGIZIYA, 24 Mar 82) .....	34
Reconstructed Baku Plant Produces More Oil Drilling Equipment (O. Bagirov; TURKMENSKAYA ISKRA, 30 Mar 82) .....	36
Work of Turkmen Geologists Described (M. Mirzakhanov; TURKMENSKAYA ISKRA, 4 Apr 82) .....	38

## ELECTRIC POWER

### INFRASTRUCTURE REVIEW AT UKRAINIAN ELECTRIC POWER STATIONS

Moscow TRUD in Russian 12 Jan 82 p 2

/Article by S. Prokopchuk, PRAVDA correspondent: "The City Has Outgrown Its Cradle"/

/Excerpt/ On 13 October 1979 the newspaper TRUD carried a report entitled "A City on Paper", which provided a criticism of the USSR Ministry of Power and Electrification for its neglect of social and services problems at the construction of the Rovenskaya and other atomic electric power stations in the Ukraine. More than two years have passed since then. Has the ministry's attitude changed toward non-production construction work? Our correspondent visited the majority of the construction sites where atomic and hydroelectric power stations are being built in the Ukraine. This is what he reports.

I will say straight out: such volumes and rates of power industry construction work are unprecedented. Judge for yourself: at the present time in the Ukraine six atomic electric power stations are being built at the same time. In this five-year plan no less than 13 million kilowatts of capacities are to be brought on line; this has made it necessary to concentrate a large number of builders, installers and operators, as well as non-production workers, at these construction sites.

Since the beginning of the construction of atomic electric power stations, entire cities have come into being - more than 780,000 square meters of housing were made available within short periods of time, kindergarten facilities for 4,390 preschoolers, dining hall and restaurants for 4,000, public schools for 8,920 students. You will agree that this is quite a bit. But as it turns out, it has not been enough. There are many reasons for this.

First, the plan for the construction of housing and social and cultural facilities was not balanced with the growth in the numbers of personnel: funds were allocated for these purposes in amounts two to three times below the need. Second, the USSR Ministry of Power and

Electrification was not prepared for such a growth in the amounts of construction of housing and social and cultural facilities and did not create the construction base required for this.

They planned on mobile wooden housing units - the "hide and seek" game of power workers. But the UkSSR Council of Ministers and the Ukrainian Trade Union Council totally rejected the temporary housing idea. Now the temporary social and cultural facilities and housing units are not actually being built at the construction sites of the atomic electric power stations. And there are a great many unresolved problems remaining.

While things are somewhat better at the Zaporozhskaya AES, at the Dnestrovskiy hydrosystem, the Chernobyl'skaya and Khmel'nitskaya AES's there is an acute problem. In Pripyat' 3,500 women must stay at home with their children when there is a critical shortage of workers at the construction site.

At the atomic power station construction sites of the Ukraine more than 17,000 families, half of which are living in others' apartments, are presently in need of housing. Things are especially bad at the Khmel'nitskaya AES, where more than 1,000 men are renting small rooms from landlords in nearby towns. Since transportation service is very poor, particularly in the winter, it is very difficult to get to work.

Only recently the managers of the USSR Ministry of Power and Electrification and the Central Committee of the Trade Union for the power workers were subjected to sharp criticism for their unsatisfactory attitude toward the housing and living needs of the atomic power station builders and toward their cultural and spiritual needs. Have they reached any conclusions from this criticism?

"Of course," I was told by the deputy minister of Power and Electrification, A. Semenov. "We plan to double the construction of housing at construction sites in the Ukraine and we are designing three new house building combines." Aleksandr Nikolayevich went on to describe a rather rosy future.

This could be entirely realistic, if the USSR Ministry of Power and Electrification had a slightly different attitude toward the realization of the decisions being made. There is every cause for such an opinion: in nine months of 1981 at AES settlements 43 percent of an annual assignment for housing was actually completed. Of nine children's institutions two were built. And of 20 cultural and services facilities only three were finished.

What is the primary reason for these and other problems in providing the power station builders with housing and kindergartens? It is primarily in the planning. Now the number of people living in these settlements considerably exceeds the planned population. For example, according to the design for the first section of the Rovenskaya AES,

a settlement for 12,236 people was to be established, but already the population of Kuznetsovsk exceeds 25,000. This is responsible for the disproportions in the municipal, trade and services areas.

Could this growth have been predicted? Of course, if the estimates had been based upon the all-union average indicator with an adjustment for the growth coefficient: after all it is young people who are building the AES. The birthrate here is from three to five times greater than the average.

V. Kizyma, the chief of the administration for the construction of the Chernobyl'skaya AES, says, "Gosplan and the ministry must approve the design of the entire power station and be able to see the city following the construction of all AES power units, rather than "retuning" it with the completion of each section." In other words, they need to think of the future rather than just living today.

This is what happens when settlements are designed in stages. In erecting the first and second sections of the Chernobyl'skaya AES a Pioneer Camp for 640 children was built. They "found" a place for it and provided the appropriate boiler and installed the sewage and water system. Now the third section of the AES is under construction and a Pioneer Camp for 300 children is being built. Could they not have seen the need for a camp for 940 children from the beginning rather than building it in sections?

Another example. A Palace of Culture for 800 was built in Pripyat'. But the city has grown. This means that it is again necessary to spend millions of rubles to build a new palace of culture instead of adding 200,000 rubles at the beginning to build one such facility. By considering the number of residents of the city following the completion of all four sections of the AES this could have been avoided.

The collectives of the power station builders of the Ukraine are resolved to do everything possible to put the AES into operation as quickly as possible, but things could have proceeded much better if the USSR Ministry of Power and Electrification had intensively undertaken the construction of housing and social and cultural facilities. In order to achieve this it is time to undertake the creation of a construction base once and for all. Specialized plants are needed to manufacture and deliver prefabricated kindergartens, polyclinics, and homes for young families. It is this method of construction of housing and social and cultural facilities that is most rational and that guarantees success in the future. Such is the opinion of those who are now building the atomic power station cities in the Ukraine.

This opinion is shared in the USSR Ministry of Power and Electrification, which must now proceed to a more active and persistent fulfillment of what is planned. This is what the atomic power station builders of the Ukraine and the USSR expect.

8927

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## ELECTRIC POWER

### EKIBASTUZ CONSTRUCTION REPORT

Moscow STROITEL'NAYA GAZETA in Russian 22 Jan 82 p 2

[Article by V. Ovchinnikov, special correspondent: "Deliveries for the Ekibastuz Fuel and Power Complex"]

[Text] In order to develop the power machine building capacities, upon which hinges fulfillment of the 26th Party Congress and November (1981) Party Plenum task to accelerate the development of the Soviet Union's fuel and power complex, the labor collectives of nine ministries have agreed to a contract for labor cooperation.

On the one hand, the enterprises of the USSR Ministry of Power Machine Building have pledged to deliver equipment to all starting construction projects for various sectors of the national economy on time and ahead of schedule. On the other hand, four contractor ministries: the USSR Ministry of Power and Electrification, the USSR Ministry of Construction of Heavy Industry Enterprises, the USSR Ministry of Construction, and the USSR Ministry of Installation and Special Construction Work have decided to accelerate the construction of plants for the USSR Ministry of Power Machine Building. Finally, the labor collectives of the USSR Ministry of Ferrous Metallurgy, the USSR Ministry of the Machine Tool and Tool Building Industry, the USSR Ministry of Heavy and Transport Machine Building, and the USSR Ministry of the Electrical Equipment Industry have given their pledge to fill the orders of the USSR Ministry of Power Machine Building on a timely basis both for the output of power equipment and for the ministry's new construction projects.

One of the projects for which the Ministry of Power Machine Building is providing equipment is the GRES-1, which is being built within the Ekibastuz Fuel and Power Complex (ETEK). Using fuel from open-pit mines, it is planned to build five such power stations, the total rated capacity of which will be 20 million KW, near Ekibastuz. This is almost the equivalent of 40 Dnepr River hydroelectric power stations!

How is the "contract of the nine" coming along here?



In April 1980 the first of eight power units at the station provided current. Last year the fourth unit was put into operation. Each of the units has a rated capacity of 500,000 KW.

Still the project is lagging behind the assigned pace of work. What is more the first three power units are not performing well: downtime as the result of emergency shutdowns amounts to almost 6,000 hours.

According to specialists, one of the major reasons for the shutdowns is that the power units were put into operation before work on them was complete. For example, the floor cleaning device (and this in a GRES with comprehensive automation and delicate instruments!) and the waterproofing of the roof and the electrical facilities of the fuel feed tunnel were not completed. (There were instances when rain penetrated through holes in the roof and soaked equipment that was being installed. As a result the equipment malfunctioned.)

The power station operating personnel are also to blame for the emergency situations. The power workers sometimes acted simply as if they did not know what they were doing by forcing the equipment to operate in a mode for which it was not designed. In order to take care of things that had not been finished and to eliminate the consequences of emergencies, they had to take builders and installers away from work on the other power units, which resulted in lost time.

The reasons for the difficult situation can be traced to when they were giving preferential attention to the construction of the industrial portion of the ETEK. In so doing they lost a strategically important point in their work and failed to develop a housing construction base on a timely basis in Ekibastuz. They also failed to build housing units at a rapid rate. Today at the construction site and within the staff of the GRES there is a shortage of skilled specialists. And because there is no housing, it is impossible to invite them to come to Ekibastuz. There isn't even any space in the dormitories, which house workers on temporary duty.

In such conditions even today the collectives of the machine building enterprises of the nation who supply equipment could do a lot to help the construction site. Primarily by manufacturing equipment without defects.

In order to better describe what is expected of the plants which supply equipment, the installers and power workers themselves discuss what is going on.

A. Kozhin, technician from the Sibenergmontazh trust: "Unfortunately, at the association 'Leningrad Metal Plant' the turbines are not subjected to stand testing prior to being shipped. As a result, for example, the rings of the high pressure cylinders that were delivered to us had to be welded on one side on the circumference by several millimeters and on the other side we had to bore the entire circumference."

V. Yanovich, chief of the GRES-1 equipment department: "All deadlines for shipping the TRN-500 transformers were disrupted by the Zaporozh'ye Transformer Plant. The Uzlovskiy Machine Building Plant (Tula Oblast) is not supplying bridge cranes on time. The Belgorod Boiler and Mechanical Equipment Plant of the USSR Ministry of Power Machine Building is delaying the shipment of high-pressure pipelines and other product."

V. Novikov, chief of the Ekibastuz Administration of the Sredazenergomontazh Trust: "The Belgorod suppliers are constantly disregarding the technical specifications for the shipping of equipment: instead of shipping installation units they are shipping them 'in pieces'. The plant is not welding the pipelines and the parts of the suspensions are arriving in boxes in bulk."

The installers are wasting a lot of time installing electric motors from the Yerevan plant. In these motors the wiring is poorly secured and we must reshape the stator; in addition the cable splicing is poor and the quality of the insulating material is poor.

In October the Minister of Power Machine Building V. Krotov, the directors, chief engineers, foremen and brigade leaders from enterprises of the Ministry of Power Machine Building visited Ekibastuz. What did this trip provide?

I can judge the positive results of this trip because I saw and learned for myself by visiting the Podol'sk Machine Building Plant imeni Ordzhonikidze, which supplies boilers to Ekibastuz.

The unit assembly shop. A transparency hangs above a span: "A green light to the orders for the Ekibastuzskaya GRES". In the shop I was introduced to the leader of the brigade of welders, V. Tenorov, who said: "I came to Ekibastuz with a group of workers from the plant to help speed up the welding of the leaks in the equipment of the second power unit and to weld the seams to prevent further leaks. We are always trying to do our best on behalf of our plant's trademark and we are proud that our product is praised for its high quality. For this reason it was particularly painful for us to see that some of the contact welded seams at the Ekibastuzskaya GRES, which we had done in our shop, had not withstood the increased loads. We had something we could refer to and vindicate ourselves. But this was not enough to do and we assured our comrades that we would convey to our comrades the favor that they raise the quality of the welding. And this I did when I returned to the plant. The work shops listened to me carefully and understood me correctly."

At the plant it was decided to speed up the execution of measures to increase the reliability of the contact welding. In particular, to speed up the development along with the scientific research institutes of new methods for monitoring the work mode of the welding equipment and an essentially new flaw detection system of the joints.

Nowhere in the world has a reliable method for the nondestructive monitoring of the quality of joints for this type of welding been found. For the time being in the shop where the steam heat exchanger, which provides a lot of problems due to leaks, they have introduced a color flaw detection system and an x-ray unit; they also use ultrasound systems.

Unfortunately, the problem concerning the stand testing of Leningrad turbines is still not solved. Last November I learned from the chief engineer of the Main Technical Administration of the USSR Ministry of Power Machine Building, Yu. Timofeyev, that the technical specifications for the necessary stand testing of the "500" transformer, which is manufactured by the Leningrad Metal Plant, had finally been signed. The Leningrad workers are preparing their test stand for this and the Ministry of Power Machine Building is building another one with its own resources. I recently called Leningrad.

The chief engineer of the association, A. Ogurtsov, answered that "the problem on stand testing still has not been solved. Two ministries are working on the problem, but it is a complicated matter and it has been pushed aside."

The cooperation of the machine builders, the builders and the power workers must be strengthened - this is the guarantee of the successful creation of the power portion of the ETEK. Its forms must be improved. And primarily it is necessary to strengthen the cooperation at the level of the ministries and enterprises through the personal contacts between the collectives of workers. In other words, the "workers' relay race" must be made truly at the worker level.

And the agreements between the enterprises are still too general in nature. I recall how surprised the power station's party office was when the Leningrad Elektrosila Plant refused to sign a "workers' relay race" contract. The problem was the contract was drawn up in too general terms, as a carbon copy, as they say. Moreover, in the traditions of the Leningrad workers to approach a competition with a business-like attitude and not to throw promises around. And so at the Elektrosila Plant they insisted that the contract be changed and to establish what and within what time periods was to be manufactured. The power workers were not prepared to specify the pledges.

It is thought that a good lesson is to be found in the "contract of the nine" for the organizers of the competition on the principle of the "workers' relay race".

8927  
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## ELECTRIC POWER

### LENENERGO OPERATION DESCRIBED

Leningrad VECHEIRNIY LENINGRAD in Russian 6 Feb 82 p 1

[Article by A. Berezkin: "These 'Seventeen Moments'"7]

[Text] Today there are very few people in the ancient building in Marssovoye Field. For the majority of the workers of the Lenenergo administration Saturday is a day-off. As I proceed to the main dispatch control panel, my steps echo in the corridors with the high arches.

And here work never ceases. Not at night, not during the day, not on holidays, and not work days..

As everyone knows electricity cannot be stored for future use. It must be obtained in the amount required by consumers at any given moment. The dynamic balance between generation and consumption is maintained by the dispatchers.

The Soviet Union's unified power system can be compared with a living organism, all parts of which function in total synchronization. The hundreds of generators not only produce current of the same frequency of 50 Hz, but even their revolving is in phase. In Moscow in the central dispatch directorate they keep watch over this unified frequency throughout the entire system. Entire electric power stations of the Volga River cascade serve as the regulators. At the control panel of Lenenergo this task is taken care of on a local scale. In addition, the dispatchers keep an eye on the excess power produced here that is then transferred to the Center.

The main dispatch control panel is located in a large machine room of an odd shape. One of its walls is in the shape of a semicircle. It completely is taken up by a diagram of the "Leningrad power system. It has been installed as a concave tableau and therefore reminds one of a wide-screen movie theater.

The senior dispatcher, A. F. Mikheyev, says, "Truly, just like at the movies, this wall reflects the life of our city. It is a unique film!. The hertz and kilowatts are the decorative fixtures on the screen."

To tell the truth I have a hard time understanding their language. But Anatoliy Fedorovich easily explains the various nuances of the power "subject matter".

He says, "It can be shown that a Saturday in the power system is sort of a day-off: the large industrial enterprises are not operating and they are the main consumers of electricity. But this is not the case. It is on such days that the greatest power loads are put on us, the dispatchers."

On the diagram the first-born of GOELRO, the Volkhovskaya GES, the Leningrad atomic electric power station, a TETs, the Krasnyy Oktyabr' veteran, and the powerful heat and power "plants" - the Northern and Southern - are lit up. Altogether there are 22 power stations. It is most convenient to repair the high-voltage equipment on days off, since it cannot be done with shutting it down. This is why the load on the dispatchers is greater on such days.

But this is not the only sign of Saturday. If a dispatcher opens a newspaper before going on duty, he first of all takes a look at the weather forecast and television programming. But this does not mean that he is worried about a fishing trip or a television program that he will miss. He has another concern in mind. A rise or fall in the temperature leads to a change in the consumption of electricity by as much as 20 MW. And the popularity of the television program "Seventeen Moments of Spring" has again and again been confirmed by an increase in the power load of the system.

8927

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## ELECTRIC POWER

### BAYPAZINSKAYA GES TURNKEY EXPERIMENT

Dushanbe KOMMUNIST TADZHIKISTANA in Russian 10 Feb 82 p 1

/Article by A. Nemirovskiy, TadzhikTA reviewer: "The Baypazinskiy Experiment: GES Being Constructed as 'Turnkey'"

/Excerpt The task for the radical improvement in capital construction was put forward by the 26th Party Congress. It is now being successfully solved in the construction of the Baypazinskaya GES, where the work is being done by subelements of Nurekgesstroy /Nurek hydroelectric power station construction trust. The annual program was completed within ten months here. And this was no accident. At the site of the project in Baypaz they are developing a capital construction strategy and tactics in conditions of a new economic mechanism.

#### 1. Excavators on the bottom of the Vakhsh River

A river without a shoreline - such is the short stretch of the Vaksh River where the basic facilities of the Baypazinskaya GES are being built. The wall of a cliff rises from the water along the right side with the current of the river - and this is where they are to build the hydroelectric power station!

The first thing that had to be done was to put in bridges from the left shoreline. The idea was to open traffic along the crest of the Baypazinskaya hydrosystem's spillway which intersects the Vakhsh River. But this was how equipment weighing 60 tons could be started. But what about the excavators which "haul" as much as 200 tons?

In the technical department of Nurekgesstroy I was told during a recounting of discussions on this problem that, "it was decided to secure the spans of the dam with metal structures. Just imagine how much time it would have taken to do this: acquire the metal, find a plant which manufactures the structures, have them delivered and begin the installation...the Gordian knot of all these problems was cut by the sword of a precise engineering estimate - the structures were secured by reinforced concrete slabs that we manufactured ourselves."



Let us drop the technical aspect of this matter, which is rather complicated, and proceed to the moral aspect. According to a long tradition, which is severe and just, the engineer who estimates the spans must stand beneath the bridge when the first traffic travels over the bridge. If it holds everything is okay; but if not the span itself passes judgement on the engineer. This custom has long been abandoned but a mistake is fully paid for even today. To the honor of the Nurek engineers, they did not avoid this problem, but assumed full responsibility for it - and they came out the winners! The road on the right shoreline was opened a full year ahead of schedule and work got underway ahead of schedule. A tidy sum of money was put aside from the assets that were saved.

And one other problem exists. During the years that the Baypazinskaya hydrosystem has been in operation, the Vakhsh River has turned back from the dam approximately 500,000 cubic meters of alluvium. According to the construction conditions of the Baypazinskaya GES, some of the alluvium was to be removed and the remainder to be pressed as rock. The designers proscribed: to install a floating hydraulic dredge which would pump off the alluvium and pour off the rock from a self-unloading barge.

Money and time are needed to create and acquire such equipment - again the problem of time! At Baypaz they came up with a different decision: using the special characteristics of the terrain they emptied the coffer of the dam on the Vakhsh River and then on the dried river bottom they brought in the excavators, which are now removing a layer of the alluvium. The river channel at this location is now dry and "paved". It is important that the coffer is now being used as one more transport crossing. This has speeded up and lowered the cost of work at several facilities.

## 2. Payoff on the road

This is one of the greatest advantages in Baypaz - more than 800,000 rubles saved in the construction of a road from Nurek, where the base of the power station builders is located, to the area where the GES is being built. This is the total amount of money saved from cutting back in the use of metal, cement, and other materials and labor expenditures. The design was attractive in its own way - the road was to be laid along the steep mass along the brow above the Vakhsh River and the precipitous shoreline was to be reinforced with bulkheads. The units were to be poured at a reinforced concrete structures plant, and then installed in place using the equipment.

The builders again decided to do things differently - they cut into the cliffs, having pushed aside the road foundation from the untrue shoreline. It is true that this resulted in a great deal more earth-moving work, but this - and this was the essence of the concept - was much cheaper than securing the shoreline with costly facilities.

In designing and adapting any facility to the local terrain, the designers therein determine also the nature of the organization of labor. This is not always the strongest part of a design because in large construction organizations, which are in charge of several construction projects, the situation changes dynamically and new opportunities arise. For this there are operational planning and management. The idea to chisel a road bed in the cliffs not only came into being as a beautiful engineering idea but because it was possible and necessary to use the excavators that were no longer needed on other sections by this time. To put it in common words, an already-formed reserve of capacities was introduced into the matter.

### 3. The position of engineer

Our society values the labor and talent of people. The specialists connected with the Baypazinskaya construction undertaking have deservedly received awards for the suggestions that have been adopted. But the idea to radically change the construction of the local road from Nurek to Baypaz was not formulated as an order for a rationalization proposal. A feeling of deep satisfaction for the engineering concept that was used far exceeded any bonuses!

The realization of the engineering solutions was full of drama. From a multitude of collisions that are connected with this - duty, technical, and social - it is sufficient to point out one, which was hardly the most significant. Sometimes it is necessary to reject a rational concept because it might be detrimental to the economic well-being of the construction organization. The principle of the greater the expenses for a construction project the higher the deductions from salary was once in effect and in some places this is still true. In its time this was of importance. Due to this principle they were able, in particular, to create a powerful construction base having extensive opportunities to solve present large-scale tasks. Now the time has come - and the 26th Party Congress pointed this out in very direct terms - to use the experience that has been accumulated. The Baypazinskaya GES is being built on this basis: the greater savings against the projected cost of a construction project that are made, the more money is entered into the account of the construction organization.

In these conditions, there is a lot of room for engineering activity and for seeking economically rational technical solutions.

### 4. Target - a year ahead of schedule

S. N. Niyazov, the manager of the Tadzhikgidroenergostroy /Tajik hydroelectric power station construction trust/ trust, has this to say about the situation at the construction site: "Due to the original engineering solutions during the first year of work at the Baypazinskaya GES significant amounts of money were saved."

"But this does not mean in any way that we have already put this money in our pockets. The simple rules of arithmetic do not always apply in economics. The true effect will provide only a final result - the early completion of new electric power capacities.

"The saved funds are being spent for the construction of facilities not called for in the design, which will make it possible to begin generating electricity at the station a year ahead of schedule. Here is an especially clear example," continued S. N. Niyazov. "According to the classic diagram for the construction of a hydroelectric station, first we should have drilled a tunnel and ran the water of the Vakhsh River through it and then on the dry section erected the building of the GES. We would have been able to commence this work only at the end of this year. Instead of this we at our own expense built a concrete wall having shut off a small area from the riverbed of the Vakhsh River, where even now we are digging the trench for the GES building. At the end of summer we will begin pouring concrete beneath the GES power units. Now the future for the installation of the two first power units of the Baypazinskaya GES will be in 1983; and this goal is entirely realistic. If it can be expressed in this way, this is the essence of our strategic goal. And the income will come from the electricity that is produced for the national economy rather than from the savings in construction. According to the conditions for the construction of the GES, we ourselves will exploit it until the full handover to the customer as a "turn key", while receiving the profit from this."

"The Baypazinskaya GES is the Soviet Union's first very large construction project being built on a "turnkey" basis. This is no simple matter: to introduce the construction project through the use of bank credit, to remain within the estimate and to still receive a profit. I repeat that we are the first. We are obliged to cope with the assignment, which is opening up new paths in capital construction.

8927

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## ELECTRIC POWER

### PETROPAVLOVSK TETS-2 NOT OPERATING AT FULL CAPACITY

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 11 Feb 82 p 2

/Article by A. Raysh, correspondent to the newspaper KAZAKHSTANSKAYA PRAVDA, Northern Kazakhstanskaya Oblast: "Power Industry Reserves into Action: In the Reflections of Past Glory"7

/Text/ At the Petropavlovskaya TETS-2 production capabilities are being poorly used.

For many years the collective of the Petropavlovskaya TETS-2 was discussed with pride at meetings and used as an example for others to follow. The majority of Petropavlovsk's enterprises was found in the front ranks. Praise for this power plant went well beyond the borders of Northern Kazakhstan. The veterans of the enterprise - the foreman of the boiler shop Viktor Aleksandrovich Fedorov, the shift chief of the power station Boris Mikhaylovich Tyumentsev - have pleasant memories about the former labor successes. They themselves were present at a solemn ceremony in putting the collective in the position of having earned the right to permanently hold the Red Banner award of the Kazakhstan Oblast Party Committee, the Oblast Executive Committee, the Oblast Trade Union Council, and the Komsomol Oblast Party Committee. Their collective has also received other awards. Now these awards stand in the Party Committee as relics of the past labor glory of the collective.

But since the mid-1970's there has been a drop in the production of electricity. We were given a note in the planning department which contained the following: "in 1976 the power station produced 2.977 billion kilowatt-hours; in 1977 - 2.776 billion; in 1978 - 2.740 billion; in 1979 2.696 billion; and in 1980 - 2.576 billion kilowatt-hours." This process did not come to an end last year either when the power station produced two billion two hundred fifteen million kilowatt-hours, which is 12 percent below the planned amount. The Petropavlovsk power workers must receive their due. They are trying to keep the curve of the production schedule from dropping further. They have had some success. With great difficulty the collective managed to meet the January plan for the production of electricity. This gives rise to the hope that there is an end in sight for the declining output.



However, to do this they must overcome the barrier of poor organization and improve the labor discipline at the enterprise. In order to bring the TETs-2 up to planned capacity, the existing 12 boilers must be put into operation. It is true that two of these boilers were disassembled because they were worn out and outmoded. But throughout the summer of last year no real efforts were made to prepare the remaining boilers at the TETs-2. Since 15 March 1981 they have started to repair the planned five boilers and by the planned time period - the middle of November - they had put only three of them into operation. The time period for preparing the remaining two boilers has been postponed. But the boilers were not repaired during the period of the postponement. As a result the power station did not receive the documentation that states that it is ready for taking on power loads.

This year a new boiler was to have been installed at the TETs-2. On the fifth of January the USSR Ministry of Power and Electrification issued an order stating that the time period for the introduction of this boiler No 6 was to be 30 November. One hundred thousand rubles were allocated for this. But the installation cost is 1,230,000 rubles. This is why the Petropavlovsk workers are wary of this very needed construction undertaking. For now they are only talking about it. But both the construction workers and the installation workers must demonstrate the maximum amount of discipline and degree of organization, without resorting to objective reasons and excuses.

Analysis suggests that the repair work program for the current year not only has not been reduced but has increased due to the number of tasks that did not get done in the past. The power workers must complete the capital repair of the third and fifth boiler units, the fifth and seventh turbines. These are very serious tasks. And how have the power station's engineering and technical workers prepared for this? We state directly that they and the managers have done an unsatisfactory job.

As before the repair work is not on schedule. The managers of the TETs-2 jointly assert that they do not have enough people. Not only do they not have enough skilled workers with right of entry documents but there is also a general shortage of installers. Why is this? There is a large turnover of labor. People cannot be kept here in one place for long. Let us take, as an example, the installation brigade for surface heating which is led by an experienced organizer, Ye. A. Stepanenko. Even his collective is made up of 50 percent new people during the year 1981, not to mention the other brigades.

For the sake of fairness it must be said that the power station does have a solid basic skeleton of a collective. The majority of the power workers labor diligently and conscientiously. We were given the opportunity over an extended period of time to observe how well the brigade of Petr Aleksandrovich Pyatkov worked on boiler No 8. Both the welders and the installers worked well together. Then, during a break, they talked freely about the advantages of the unified contract method that has been adopted here. Welder A. P. Leont'yev, a labor veteran, joined in the conversation.

Aleksandr Petrovich said, "You know I have been working here since the power station was put into operation. That is more than 20 years. And when we first switched to working on the unified order with pay by the coefficient of labor expenditures each of us understood that this was a necessary thing. And all of us began working diligently."

In specific examples one can become convinced that due to the adoption of progressive forms of labor organization a stable, capable collective has evolved. The collective itself decided to put the boiler No 8 into operation ahead of schedule. In this manner the possibility to generalize and adopt this progressive experience was at hand. At this point the economic managers, the party, plant and Komsomol committees must speak their piece. Based upon this experience, they were required to strengthen labor discipline within the collectives of the power station, to bring organizational and mass-political work to the needed level, to establish strict control over the fulfillment of pledges, and to activate the socialist competition.

At one of the technical meetings the TETs specialists had a serious conversation about the amounts of capital and medium repairs on the boiler units for the year. They then scheduled every detail as to what and when it was to be done. But the problem was that the estimates were not supported by material capabilities. At this enterprise the poor provision of the power station with everything that it needs is quite evident. There is a shortage of spare parts for both the primary and the auxiliary equipment. And, finally, the managers of the Kazakh SSR Ministry of Power and Electrification must respond.

Vladimir Ivanovich Ukhabov, chief engineer of the TETs-2, says, "the Barnaul Boiler Plant deserves serious reproach. This enterprise provides us with a screened system of pipes that are a millimeter smaller than those we have on the boilers produced by the Taganrog 'Red Boiler' Plant. As a result the screening system is frequently disrupted. On some boilers we have replaced as much as 50 percent of such pipes. The normal service life of these pipes is 150,000 hours, but those that we have are lasting only about half that amount. Another reason for the rapid wear of the equipment is that the coal that we receive from Ekibastuz has an ash content of 42 to 47 percent instead of the estimated content of not more than 35 percent."

The capital and medium repairs to the thermomechanical equipment of the power station are performed by the contract method, which is performed by the Petropavlovsk sector of the production-repair enterprise Tselinenergoremont. According to the contractor, the Kazakh SSR Ministry of Power and Electrification is doing a poor job of supplying the contractor organization with the needed amount of pipes and metal. This is having a negative impact upon the fulfillment of the needed amounts of repair. Frequently the boilers are idle for 60 to 80 days in excess of the norms.



The power station's water supply system is an important and pressing problem. When the TETs was put into operation in 1961, the salt content of the water in Beloye Lake was 320 milligrams per kilogram of water. Now this figure has increased to 1,200. This also speeds up the wear of the equipment significantly. It is planned to construct a second pumping station which will provide fresh water. But, is it not peculiar, that the TETs-2's own construction administration is working very slowly on this needed section.

In speaking about the problems of increasing the output of electricity at the TETs-2, especially during the fall and winter of 1981 - 1982, we cannot fail to mention the problem of how electricity is used in the national economy of the oblast.

As we have already been convinced the Petropavlovsk power workers are having a very hard time in producing electricity. The fact that some consumers have a lackadaisical and wasteful attitude toward electricity causes some bewilderment.

As soon as the frosts came and the temperature fell below 20 degrees C in our oblast, the expenditure of power, especially by the sovkhoses and kolkhoses, increased 3-fold. Much power is wasted on superfluous heating. On the farm in the village of Bekseit in Mamlyutskiy Rayon, for example, water for livestock is heated in a tank that is not insulated and that does not even have a lid. The doors of the facility are not closed. Dozens of unneeded lights and heaters are permitted to burn. At the Aleksandrovskiy sovkhos in Vozvyshenskiy Rayon the pig sties are not insulated and only electric heaters maintain the high temperature. At farms of the central grounds of the Petropavlovskiy Sovkhos the majority of the windows do not have glass and the window openings are filled with hay. The electric heaters are left running 24 hours at a time.

In a word, the situation is similar to the saying, "sometimes there is lot, sometimes little and sometimes nothing at all." The extreme consumption of electricity in one place leads to a sharp shortage in another. Sometimes, the TETs-2 simply shuts off some consumers. This seriously affects the rhythm of the farms. For example, the director of the oblast association Sel'khozenergiya, P. S. Popov, with alarm described cases where the electricity had been shut off. Just in January the Tselinnyy Rayon was undersupplied by thousands of kilowatt-hours of electricity. As a consequence of this at farms of the Michurinskiy, Leninskiy, and Belogradovskiy sovkhoses did not have electricity for nearly 10 hours. Because of this cows were not milked on time and the feed shops were shut down. It is not difficult to estimate the losses that were incurred for this reason.

The Communist Party and the Soviet government are directing the workers of all sectors of the economy to conserve fuel and power resources. At the November (1981) Party Plenum of the CPSU Central Committee the importance of developing the fuel and power complex and the need to

rapidly adopt energy conserving equipment and technology was emphasized.

The Northern Kazakhstan Oblast has long ago become an oblast of dense electrification. There is no branch of industry, village or construction site where the need for electric power does not increase daily. From this stems the primary task of the collective of the Petropavlovskaya TETs-2 - to strengthen its struggle to increase the efficiency of its own production and to use all reserves for successfully fulfilling the plans for the generation of electric power. The task of the consumers is to strictly monitor the use of electricity and to have a thrifty and proper attitude towards it.

8927

CSO: 1822/116

## ELECTRIC POWER

### ACCELERATED COMPLETION OF POWER PROJECTS CALLED FOR

Baku VYSHKA in Russian 12 Feb 82 p 1

[Article: "Accelerate the Introduction of Power Industry Projects"]

[Text] A new high-voltage electric power transmission line of a length of 300 kilometers and a substation have joined Ali-Bayramlinskaya GRES imeni Il'ich with the Dagestan ASSR. These projects will increase the reliability of the power supply to several regions of the Azerbaijan SSR and the neighboring autonomous republic.

This report from the correspondent of the newspaper VYSHKA is one of many covering the construction of power industry projects, which, as determined by the 26th Party Congress, are among the base sectors of industry.

As the population and the number of industrial production facilities rise so also increases the expenditure of electric power. At the 30th Azerbaijan SSR Party Congress it was noted that the development of the electric power industry is still lagging behind the increased needs of the Azerbaijan SSR's national economy; this is evident in the fact that the production of electricity is two billion kilowatt-hours below what is needed. This shortfall is being augmented by the transfer of electricity from the unified Caucasus power system.

Last year they managed to accomplish quite a bit in this direction in order to fulfill the decisions of the 30th Azerbaijan SSR Party Congress. Azerglavenergo successfully dealt with the indicators which describe capital construction: the capital construction plan was fulfilled by 122.5 percent, the construction and installation plan by 104 percent, and the plan for the introduction of fixed assets by 106.6 percent.

Included in the introduced projects were the power transmission lines with a total length of nearly 2,000 kilometers, 383,200 kilovolt-amperes of transformer capacities. Much was done to improve the living and housing conditions and the working and relaxation conditions of the workers and their families. At the Azerbaydzhanskaya GRES, the Shamkhorskaya GES, in Khachmas, Ali-Bayramly and Masally nearly 1,000 apartments were occupied; and in Baku the first section of a dispensary was completed.

Of course, the kindest words must be said about the participants in the construction of the Azerbaydzhanskaya GRES. Their diligent work was crowned with a tremendous labor victory: the first 300,000 KW power unit was put into operation ahead of schedule. The economic significance of this fact can be evaluated in this manner. Now the first unit is generating more than five million kilowatt-hours of electricity every 24 hours, which is more than the 24-hour output of the Mingechaurskaya GES imeni Lenin. Due to the efforts of the power station operators, who have pledged to put the power unit at planned capacity ahead of schedule, its contribution to increasing the republic's power resources will increase.

In providing the high rates of construction of the Azerbaydzhanskaya GRES and the reliable operation of the existing power unit, there is no doubt but that a positive role is being played by the organizational and educational work performed by the Mingechaurskaya City Party Committee, which has organized a regularly operating headquarters for monitoring the construction, introduction and assimilation of capacities. The daily attention shown by the party organization toward the everyday needs of the builders and power station operators, their cultural services, ideological and political growth, and the organization of an effective socialist competition, is making it possible to place responsible tasks before the general contracting and subcontracting organizations and to achieve their successful fulfillment.

In the area of power industry construction and increasing the power resources much remains to be done in the 11th Five-Year Plan. In particular, it is planned to ensure the accelerated construction and ahead-of-schedule completion of the Azerbaydzhanskaya GRES and the Shamkhorskaya GES with a total rated capacity of 1,580,000 kilowatts. Another 75,000 kilowatts will be added by increasing the capacity of the Mingechaurskaya GES imeni V. I. Lenin. New substations in Sangachaly, a power transmission line between Ararat and Babek, and other projects will also be built. The output of electric power will be increased by no less than 1.3-fold. The Azerbaijan SSR has never known such a large increase in the capacity within a single five-year plan and such a rapid growth in the amount of electricity produced.

It is quite clear that the fulfillment of this important program depends primarily upon the rates of capital construction, the very precise organization of the construction work, the use of industrial methods, the complete concentration of workers and resources, and the clear setting in motion of the planned complexes.

A special feature of the 11th Five-Year Plan in the area of power industry construction is that new capacities will be put into operation in each year of the plan. Last year marked the beginning of this effort; and this year the socialist pledges call for the second power unit of the Azerbaydzhanskaya GRES and the first hydrounit of the Shamkhorskaya GES to be put into operation two months ahead of schedule. It is a matter of honor to the general contracting organization of the Azenergostroy

trust and its main subcontractors, subelements of the Kavkazenergomontazh trust, to successfully cope with these pledges.

Experience shows that it is very important to maintain high rates from the very first weeks of a new year. Unfortunately, at times the efforts of the builders are wasted due to misunderstandings in planning and disruptions in the delivery of equipment, machines and materials. Already these misunderstandings have begun to slow down the pace of work at the Shamkhorskaya GES. At this project they are short two gantry cranes, which must be assembled before filling the reservoir. Time is running out and the customer, the directors of the GES, still have not made a final decision regarding the delivery of the cranes or of the generators from the Novosibirsk Energotyazhmash Plant.

The customer, the board of directors of the Azerbaydzhanskaya GRES, is also to blame for delaying the effort to accelerate the pace of work. As long ago as last year the foundations for the boiler of the second power unit were ready. But as of now there is no casing, although the boiler units are already coming in from Taganrog.

Dozens of subcontractors and materials and equipment suppliers participate in the construction of each project. The comprehensive socialist competition on the "workers' relay race" principle plays an important role in combining their efforts. In his greeting to the participants in the construction and assimilation of the new complex for the refining of oil in the refineries of Azerbaijan, Comrade L. I. Brezhnev noted that a decisive factor in the achieved successes has been the close cooperation of the collectives of builders, installers, designers and power station operators. Positive experience has been accumulated in this area in Mingechaur. This experience must be used immediately by those participating in the construction of the Shamkhorskaya GES and the Azerbaydzhanskaya GRES. The board of directors of the latter would find it useful to implement the "workers' relay race" principle in acquiring a new supplier for the casing from Rostovskaya Oblast.

Much remains to be done by the Shamkhorskiy Rayon Party Committee. It is necessary to speed up the organization of a headquarters for the construction and to increase its attention to the daily progress of the construction, the organization of the socialist competition, and the creation of conditions for the workers to do highly productive labor.

All collectives of builders, installers, and power station operators - the initiators of the competition to introduce the power industry projects as quickly as possible need to be deeply aware of their responsibility for their fate. All reserves must be used to pick up the pace of work and to improve quality so that all planned capacities can be put into operation within the indicated time period as called for in their pledges.



## ELECTRIC POWER

### YERMAKOVSKAYA GRES POWER OUTPUT LAGGING

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 13 Feb 82 p 2

/Article by V. Stupak, correspondent for the newspaper KAZAKHSTANSKAYA PRAVDA: "Power Industry Reserves into Action: If the Flagship Has Lagged Behind"/

/Text/ Relatively recently, four to five years ago, the flagship of the Kazakh SSR's power industry - the Yermakovskaya GRES - achieved an annual output of electricity of 17 billion kilowatt-hours. But in the past heating season the power station generated only 14.4 billion kilowatt-hours of electricity for the network; and its economic and technical indicators can only be viewed as negative, if used as an example. With an established rated capacity of 2.4 billion kW the GRES is maintaining a load of only 2.1 to 1.9 billion kW. What has happened with this giant of the thermal power industry?

The office walls of the GRES director are covered with diagrams of indicators for the past ten years: the electric power outputs, the expenditure of fuel, the number of emergency shutdowns, the production costs of a single kilowatt-hour, and the ash content of the coal, etc. Previously the director would lead the correspondent to these impressive line diagrams and explain the situation. Today Aleksandr Vasil'yevich Panasenko did not even glance at the walls.

"The basic reasons for what has happened must be sought in Ekibastuz not in Yermak," he said with great importance. Getting up from his desk he invited us to the front corner of the office. There on the parquet floor was an unsightly heavy iron junk: the broken pieces of some sort of machinery; the 150-kilogram tooth of an excavator, which resembled the tusk of a mammoth; a pile of rail washers; and a heap of steel bearings.

The director lifted one of these pieces weighing 4 to 5 kilograms in his hand and explained:



"The coal suppliers are destroying our mills with these things. No machine is able to withstand or regrind such 'raw material' without breaking. No super magnets are capable of protecting the machinery from this junk since the rotor parts are manufactured out of manganese steel."

This is one of the reasons for the emergency shutdowns. It is far from being the primary reason, but it attests to the fact that the miners have started processing the heavier rocks (where the teeth are broken on the excavators) and delivering high-ash content coal, which requires more powerful and strong grinders. It turned out that the power workers were not ready for this.

We are not speaking only of the grinders. All of the equipment that is used in the processing and burning of coal with an increased ash content is subjected to heavy wear and tear. This requires more frequent replacement and the rebuilding of many units. However, the electrical equipment industry has not increased its capacities and has begun delivering less than it did before.

Thus the Barnaul Sibenergomash /Siberian power machine building/ Plant is not even supplying half of the exhaust fans, ventilators and spare parts for them that it should. The Baranovich plant is not providing the planned serrated sleeves, casings, exhaust fan blades - altogether more than a dozen different pieces of equipment. The Proletarskiy Plant in Leningrad is not filling orders for spare parts for the turbofeed pumps. And papers signed by the managers of the Kazakh SSR and the USSR ministries of power and electrification, the resolutions made by the managers of the machine building departments are not helping to solve the problems. How can a power unit function without the turbofeed pump? This leads to the loss of 100,000 KW within the power system.

Previously the operation of the Yermakovskaya GRES was often compared with the Reftinskaya GRES in the Urals, which has similar equipment. Also burning Ekibastuz coal, the Reftinskaya GRES, however, continues to operate on a stable basis. Why the difference?

"Near REfta there is a powerful industrial base, the large machine building enterprises of Sverdlovsk, which help the power station with castings and the manufacture of spare parts," explains the deputy chief engineer, Igor' Alekseyevich Yakubenko. "But we still are unable to cast or manufacture even the simplest parts at the plants of the Kazakh SSR. Only now with the help of the party organs have we reached an agreement that the Yermakovskiy Ferroalloy Plant, the Karagandinskiy Metallurgical Combine, and the Pavlodarskiy aluminum and tractor plants will begin filling our most urgent orders."

There are many technical difficulties, problems and snafus at the Yermakovskaya GRES. Still, if one investigates more deeply one can see that these are not the main reason for the unreliable operation of the flagship. It is no accident that the power station director came up with the retort that the causes of the problems need to be looked for in Ekibastuz rather than in Yermak. There is some truth in this.

The worsening of the Yermak power station's operation began with the start up of the first power units in Ekibastuz. This came as no surprise because it was the Yermakov workers who were largely responsible for "untwisting" the new GRES. Every year nearly one fourth of the collective continues to leave for Ekibastuz. Moreover, as a rule, it is the more experienced engineers and skilled workers who are leaving. Things have gotten so bad in Yermak that the senior machinists are on watch only for two shifts rather than three as required.

The transfer of the thermal equipment installers to Ekibastuz was particularly harmful to the reliability of the electric power station, because these are the most highly skilled specialists on boilers and turbines. Previously they performed nearly 270,000 to 320,000 rubles worth of capital construction work here each year; but last year they barely managed to assimilate 30,000 rubles.

If one also takes into consideration that the Sevkazenergozemont is understaffed by almost 260 men at the Yermakov subelement, then it becomes clear why emergency shutdowns have become so commonplace at the flagship, why equipment is malfunctioning, and why there is only a partial power load on the station. This leads to a very dangerous situation for the power industry: the machinery is taken down for repair and preventive maintenance as needed rather than in accordance with a schedule, and usually only the face of a threatening emergency. Units and parts are replaced only partially rather than completely. In a word, why worry about luxuries, when we have all we can do to just keep alive.

For example, power unit No 6 should have been shut down last year for mid-service life repair, but since the repair work on power units No 2 and No 5 had taken so long (they were short one third of the repairmen), this was not done. The power unit went into the winter season unprepared. Shutdowns are particularly frequent due to the delayed repairs to boilers.

Now the situation with the postponement of preventive maintenance and repairs is getting worse and becoming imbedded, so to speak, from the top on down. In particular, there are more frequent telephone calls from the central dispatch administration of the Kazakh SSR Ministry of Power and Electrification: "In view of the shortage of electric power we forbid you to shut down the power units for planned measures." The vicious cycle is completed.

One cannot remain silent about one other problem. The Yermakovskaya GRES has been in operation for 13 years, but still all of the construction work is not completed. The second line of the coal feed, the oxygen plant, and the slurry unit have not been built. In the power station facility itself the power construction workers have been unable over a 13 year period to install the cranes, lifters and elevators called for in the design. For this reason the repairmen must proceed to the top of the 40-meter boiler several times a

day on foot (this is the equivalent of a 14-storey building!).

The collective of the YermakGRES Construction Administration, which must complete the work on the power station, are now busy with new construction projects in Ekibastuz. The impresssion is created that the Yermakovskaya GRES is no longer of any interest to anyone. The power station is now beginning to operate at a loss. Is this not the most important misfortune of all?

8927

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## ELECTRIC POWER

### UNSATISFACTORY PRODUCTION FIGURES CITED

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 14 Feb 82 p 1

/Article: "More Organization at the Start"/

/Excerpts/ The first month of the new year is behind us. This year is the next stage in fulfilling the assignments of the five-year plan, the social and economic program of which was outlined by the 25th Party Congress. What sort of achievements have the workers of the Kazakh SSR's industry accomplished during this beginning and most difficult period?

The work results of the Kazakh SSR's industry show that there have been some losses. This can be seen mostly in the fact that there was a drop in the labor rhythm of several enterprises. As a result the monthly assignment for growth in labor productivity was not fulfilled by some sectors of the economy and for the Kazakh SSR's industry on the whole.

One of the main reasons for the nonfulfillment of the plan by enterprises of the nonferrous and ferrous metallurgical, chemical, construction materials industries and other sectors of the economy was the unsatisfactory operation of the thermal electric power stations of the Kazakh SSR Ministry of Power and Electrification (Minister B.P. Ivanov). As a result of a large number of emergencies, the power stations were unable to carry the assigned power loads for the generation of electricity. This included the following power stations: Ekibastuzskaya GRES-1, Yermakovskaya GRES, Pavlodarskaya TETs-3, and the electric power stations of the Karagandaenergo and Tselinenergo regional administrations. This in turn led to shutdowns of shops and entire production facilities. The managers of the Kazakh SSR Ministry of Power and Electrification, the party and council organs at the local level must take immediate steps to improve the operation of the power stations.

8927

CSO: 1822/117

## ELECTRIC POWER

### BRIEFS

**MORE ON KURPSAYSKAYA GES**--This year it is planned to put into operation the final third and fourth 200,000 KW power units at the high-mountain Kurpsayskaya GES in the Kirghiz SSR. The first two turbines were put on line ahead of schedule at the start of the 11th Five-Year Plan. The experience of the rapid introduction of the units by the collective of the Naryngidroenergostroy Construction Administration in constructing this electric power station is now being copied by other hydro- electric power station builders. Altogether five years have gone by since the start of the construction project until it began producing industrial current. Usually this takes half again as long to accomplish. The previously created production base for the construction of the Toktogul'skaya GES, the first of the Naryn River cascade, was used skillfully. As a result there were savings in time and means for the construction of its own construction materials industry. With its attainment of rated capacity - 800,000 KW - the Kurpsayskaya GES increases by almost a third the output of electricity within the Kirghiz SSR. In connection with the Toktogul'skaya GES the Kurpsayskaya GES will make it possible to provide a stable irrigation for tens of thousands of hectares of farmland in the Kirghiz SSR and the Uzbek SSR. Having joined in the competition to commemorate the 60th anniversary of the USSR's formation, the Kurpsayskaya GES builders have decided to complete work on the third and fourth power units ahead of schedule. Along with outstripping the plan, the collective of the Novosibirsk Heavy Power Machine Building Plant has promised to deliver both generators to the construction site. This is how the "workers' relay race" operates. /Text/ /Moscow EKONOMICHESKAYA GAZETA in Russian No 6 Feb 82 p 9/ 8927

**TRANSFORMER FOR THE KOLYMSKAYA GES**--Magadan. From the moorings of the sea port of Nagayevo has begun the final stage in its long journey to its final destination - a transformer for the Kolymskaya GES, which is under construction. Built at the Zaporozh'ye Transformer Plant, the transformer has traveled clear across the Soviet Union by rail to the sea port at Vanino. Here it was installed on a special platform and then the 186,000 ton unit was shipped on the sea ferry, the "Sakhalin-6". The passage through the Sea of Okhotsk was difficult. The heavy seas that developed following a storm caused the ferry boat to



list considerably, but it did not damage the transformer. A. V. Surzhenko, the captain of the "Sakhalin-6", decided to enter the ice. At this point the ship was assisted by the new icebreaker, the "Kapitan Khlebnikov", which took the ferry through the ice field to the mooring of the Magadan sea port. The final 500 kilometers of the journey the transformer will travel in two stages enroute to the settlement of the hydroelectric power station builders: to the transshipment base of the Kolymskaya GES in the settlement of Ul'tara and then, when the ice on the river is sufficiently thick, it will be shipped on. /Text/ /Moscow SEL'SKAYA ZHIZN' in Russian 13 Feb 82 p 17 8927

GEOTHERMAL POWER STATION IN STAVROPOL'--The first of six exploitation wells of a geothermal electric power station has been drilled. By the end of the five-year plan this power station will be in operation near the settlement of Kayasul. Here at a depth of 4,500 meters the geologists have found a sea of heated thermal water. The specialists who came up with the design for the construction of Northern Kazakhstan's first experimental-industrial electric power station, which is to operate on the energy of the earth's interior, believe that the supplies can provide for the operation of a cascade of geothermal electric power stations with a total rated capacity of one million kilowatts. /Text/ /Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 24 Feb 82 p 2/ 8927

KIEV TETS-6 PROGRESS REPORT--The first power unit of the Kievskaya TETS-6, the largest in the Ukraine, has been put into operation. Its rated capacity is 250,000 KW of electricity and 560 Gcal of heat per hour. The plan calls for the construction of three additional such power units. After they are completed the TETSs will be able to provide heat and electricity for the housing of one million people. /Text/ /Minsk SEL'SKAYA ZHIZN' in Russian 4 Mar 82 p 17 8927

PERMSKAYA GRES PROGRESS REPORT--The first sections of the 800,000 KW power unit have reached the construction site of the Permskaya GRES. The supplier was the Leningrad Elektrosila Plant. /Text/ /Moscow EKONOMICHESKAYA GAZETA in Russian No 6 Feb 82 p 37 8927

MORE ON THE PERMSKAYA GRES--The first units of the 800,000 KW power unit have reached the Permskaya GRES construction site; they were provided by the Leningrad Elektrosila Association. The pace of work picks up with each passing day. At the foundation of the main building the arrows of the powerful cranes point toward the sky. The contours of the machine room are clearly discernible as are the concrete plant and other facilities. Approach railroad tracks have been built to the construction site and on the shore of the Kama River they are building a mooring for the cargo ships. This year will be one of the most important stages in the creation of the GRES: they must install 10,000 tons of preassembled reinforced concrete, 16,000 tons of metal structures. Next year the enterprises of the Western Urals will receive power from the first power unit of the new thermal power station. /Text/ /Leningrad LENINGRADSKAYA PRAVDA in Russian 26 Jan 82 p 17 8927



NUREK POWER LINE--At the construction site of the new LEP-550 - from Nurek to the city of Rursunzada - a 200 support has been delivered to the Chormazak Pass. /Text/ /Moscow PRAVDA in Russian 8 Feb 82 p 17 8927

POWER FOR WEST SIBERIA--The northernmost sector of the second power bridge, which will connect the oil and gas fields of the Central Ob' River area with the Urals, has been completed. This is the substation Dem'yanskaya - Surgut. /Text/ /Moscow PRAVDA in Russian 2 Feb 82 p 27 8927

LEP-1150 EKIBASTUZ TO THE URALS--The installers of the Ekibastuz to the Urals LEP-1150 have completed a difficult operation. Having used a system of jacks, powerful winches and steel cables, they have installed two super powerful transformers weighing nearly 500 tons in place. Thus began the installation of the basic substation of one of the Soviet Union's largest power bridges, which will deliver power to the enterprises of the Urals from a series of GRES's, which are to operate on inexpensive Ekibastuz coal. The installers have prepared carefully for this day, as have the railroad workers and specialists from the Zaporozh'ye Transformer Plant, who manufactured the assemblies for the substation. They have been working according to the "workers' relay race" principle, having joined together into a united production pace all those participating in the construction. At the same time they completed work. They prepared the roll-back tracks and anchors for the transformers, which were delivered right on schedule to the site by the railroad workers. In the third quarter of this year the first section from Ekibastuz to Kokchetav will be carrying current. On this route the supports have already been installed and the wires hung. Equipment for the LEP-1150 reaches the construction site of the Ekibastuz conversion complex on a daily basis. The equipment goes directly from the railroad cars to the installers. /Text/ /Moscow KRASNAYA ZVEZDA in Russian 7 Feb 82 p 17 8927

CSO: 1822/116

## FUELS

### DEEP OIL AND GAS DRILLING IN AZERBAIJAN OUTLINED

Baku VYSHKA in Russian 19 Feb 82 p 2

[Article by K. Kerimov, Doctor of geological and mineralogical sciences, head of the section of the Southern All-Union Scientific Research Institute of Geophysics: "Looking into the Depths of the Earth: Problems of Search and Exploration in Azerbaijan for Oil and Gas Fields at Great Depths"]

[Text] It is common knowledge that oil and gas are both wonderful sources of heat, and an irreplaceable raw material for the chemical and many other sectors of industry.

Oil and gas occupy one of the key positions in the development of the national economy, in the rise in the welfare of the Soviet people, and in guaranteeing the defense capability of the country and the peaceful creative labor of the Soviet people. The 26th CPSU Congress therefore focussed exceptionally important attention on the development of the fuel and energy complex and set important and complicated tasks before the workers of the oil extracting industry in the 11th Five-Year Plan.

Now, in addition to the search and exploration for oil and gas fields in new areas and promising structures, the search and scientific research services of many countries in the world are paying serious attention to the problem of studying the oil and gas content of great depths as well.

The practical results of deep and superdeep drilling in the southern USSR, including within the vast territory of Azerbaijan indicate the great potentialities for developing the oil and gas industry through hydrocarbon fluids which are contained in the very deep deposits.

This is indicated, in particular, by the oil and gas and gas condensate deposits which have been established in a whole series of structures in the North Caucasus (in the Tersko-Kuban depression), Transcaucasus and South Caspian basin (in the Baku archipelago). Oil and gas deposits have been established here, in particular, at a depth of 5,800-6,200 m (Andreyevskiy field, Bulla-more and a number of others). In addition, periodic eruptions of mud volcanoes on individual sections of the vast South Caspian area of regional deflections testify to the presence of fuels in the very deep deposits.

It is known to geological science that based on the substance composition of rocks discharged to the surface, the researchers link the core samples of

these volcanoes in the majority of cases with the Paleogene-Miocene and Cretaceous periods. Examples of an even earlier age are presented in a number of cases. Of course, there can be no doubt as to the reality of these conclusions which are based on the results of numerous analyses of the stratigraphic affiliation of the discharged rocks. As for their oil and gas content, there must not be any questions either, since the oil and gas content of the Paleogene-Miocene, Cretaceous and partially the Jurassic has already been proven by the data of single wells on the Alpine folded zone in southern USSR.

Consequently, the oil and gas content of the deeply buried deposits of the majority of structures in the region, no matter how deep they are, should raise no doubts, if only there is a favorable geological situation for this. According to calculations made, the spatial position of the Paleogene-Miocene and Mesozoic complexes of deposits in which there are all the prerequisites for a positive assessment of the oil and gas content covers an interval of 5500-8500 m. If we start from the results of an analysis on the main geological-field and geophysical criteria, then one should note that they almost completely meet the requirements, primarily, tectonic and thermodynamic. Thus, for example, if in East Ciscaucasia and the West Kuban depression industrial deposits have been discovered in geothermal conditions of 170-180 degrees, based on a set of characteristics of the depths of the main oil and gas regions in Azerbaijan, we can quite boldly begin exploration of the depths to 7000-8000 m.

With regard for the actual data for our republic, even now it is important to focus attention on those regions which today may be of prime interest for setting up and conducting search and exploration for oil and gas in the deep deposits of the Meso-Cenozoic complexes. In the Nizhne-Kurinskiy depression, this is primarily the same region of the Kyurovdag-Neftechala zone of elevations where industrial working of the oil and gas deposits of the productive mass is currently underway, the region of the Dzheyrankechlizskiy depression, and finally, this is the depths of the overwhelming majority of structures in the Apsheron oil and gas oblast.

Another, no less important question is clarification of the potentialities of the drilling equipment for revealing and testing the productive areas at such deep depths. It is precisely here, in our opinion, that there must not be any difficulties of a basic or difficult-to-overcome nature.

For the world's deepest wells were drilled for the first time precisely in our country (Kola superdeep well is already approaching the 11,000-meter mark, well No 1 in the Shevchenko field has exceeded the 7500-meter mark). In addition, the greatest number of deep wells (5500-6500 m) has been drilled in the Soviet Union precisely in the flatland and piedmont oblasts in southern USSR, including in Azerbaijan.

Several exploratory wells have been drilled on the territory of our republic (including in the adjacent water area of the Caspian). In five of these wells, formations have been discovered which are no less than 6500 meters from the surface of the earth, and the 7800-meter level has already been passed in Saatly.

Thus, we have the equipment and the know-how to drill wells to great depths. In this respect I would like to touch upon the question of the real potentialities for drilling these wells. It is common knowledge that almost all the geological services of our republic set up their practical activity for arranging and managing work based on a common meterage which is defined by the USSR Ministry of the Oil Industry. It is easiest of all, of course, to plan drilling of wells under these conditions. These are the wells whose drilling almost in advance promises the production engineers the greatest chances of success, both from the viewpoint of the deepness and the selection of the section of the deposit. I primarily have in mind drilling on the new sections and tectonic blocks of the already known fields of wells with depth from 4000-4800 m. This situation is justified by the fact that it makes it possible to confidently solve to some degree those planned assignments which have been set for today before the oil workers of the republic. I stress, namely for today. And in the future?

I have to say directly, unfortunately, that not at all sufficient attention is being paid to this extremely important question. It should occupy a worthy place in solving the general energy problem for many years ahead.

It is sufficient for clarity to cite the example that an enormous number of research organizations of an oil profile which we have in our system of the republic Academy of Sciences and the sector ministries are operating separately from each other. There is no coordination of the scientific research to compile and realize comprehensive programs to search for and explore oil and gas fields at deep and superdeep levels.

It would apparently be expedient in the current situation to institute in the presidium of the Azerbaijan SSR Academy of Sciences or in the production association "Azneft" a council for coordination of the scientific research institutes and the production work to search for and explore the deep oil and gas fields. It is also necessary to set up outside the association "Azneft" an independent, and moreover, specialized production organization to drill deep exploratory wells.

At the same time, it would be expedient even now to pursue a certain increase in the deepness of the planned wells through partial reduction in the number of wells that are drilled at the fields to be worked to the planned depths of 4800-5000 meters. This could affect the current level of oil and gas extraction in the republic, but, nevertheless we would be pursuing a course to satisfy the long-range demands of our industry and the national economy for oil and petroleum products.

Work to bring the drilled wells to their planned depths is exceptionally important. There is, unfortunately, something to think about here for both the production engineers and the workers of the scientific research institutes. Whereas of the wells currently drilled to a depth of 4500-5000 m, tens of percents are eliminated for technical reasons, one can speak of the deeper layers of the earth's crust where the rocks in the majority of cases are in high thermobaric states and under anomalously high vapor pressures. Therefore not taking the appropriate measures for the correct selection not only of the technology and equipment, but of the entire technological regime of drilling these wells may lead to discreditation of this work which is very important for the national economy.

In the limits of the majority of structures of the Apsheron oil and gas oblast, one can expect the discovery of Oligocene-Miocene and even Cretaceous formations which are promising in an oil and gas respect at depths from 3000 to 5000 m. This means that even now there are real opportunities in which the oil and gas levels which are associated with the Paleogene-Miocene and partially Cretaceous periods can be revealed here by wells of the same, and even shallower depths which are being drilled in the deposits of the productive masses at the majority of the operating fields of the Kurinskiy basin.

The correct selection of the entire complex of technological characteristics of well drilling is one of the serious questions.

Based on the methods we have developed, it is now possible to predict with a great degree of reliability the zones with anomalous condition of pressures not only in the argillaceous beds, but even in the collectors (by the way, for the first time in the practice of oil geological science).

Thus, although questions of searching for and exploring oil and gas fields at great depths are of exceptional importance for the national economy, many aspects of this large problem continue to remain open. At the same time, a very serious attitude towards it and only intensification of the solutions can play a significant role in fulfilling the decisions of the 26th CPSU Congress and the 30th Congress of the Azerbaijan Communist Party.

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CSO: 1822/131



## FUELS

### TURKMEN GAS WORKERS CONTINUE INTENSIVE WORK

Frunze SOVETSKAYA KIRGIZIYA in Russian 24 Mar 82 p 2

[Article by S. Gochiyayev: "Gas Workers Storm the Depths"]

[Text] A display screen shines on the work table of the head of the industrial association "Turkmengazprom" V. Talday. Conversing, Viktor Andreyevich unnecessarily digs into his writing pad and flips through fat cases with summaries; he can instantly recover the necessary table from the memory of the electronic machine with a simple pressing of the keys. This is a characteristic sign of modern scientific and technical daily life.

"The gas industry would simply be impossible in our time without electronics," says V. Talday. "Automatics and tele-automation are one of the main trends in the development of the sector in the 11th Five-Year Plan. With the completion of automation of the Beurdeshtik field we mainly switched to centralized control of the gas pressure and temperature at all the sections. There are two information-computer centers currently in operation in the association. Computers are used to solve over 100 technological, economic and other problems. The day is not far off when a unified automated control system will be created."

A column of figures lights up on the green screen with a long row of zeroes. The sums mainly have nine digits.

"This is the dynamics of our growing production," the head of the association commented. "Since the beginning of the year, 'Turkmengazprom' has provided an additional 300 million m<sup>3</sup> of gas to the plan. The labor mood at the fields is high. Competition in honor of the 60th anniversary of formation of the USSR is gathering strength and we have all the grounds to assert that the above-plan account of the Turkmen gas workers by this great date will reach 650 million m<sup>3</sup>."

The course for intensification of extraction and extending the maximum level of removal of raw material on the workable deposits is being combined by us with energetic development of new fields, in particular, in the most powerful field in Central Asia, the Dauletabad. By the end of the five-year plan, the percentage of the new gas extracting complex will be brought to 22 billion m<sup>3</sup>. Its role is even more important since the reserves of the new field

and gradually and more actively supplement the natural decrease of blue fuel in Shatlyk where half of the Turkmen gas is currently extracted."

The explorers of the depths have spent 5 years getting to the wealth of the Dauletabad "storehouse," and their efforts have been successful: the gas reserves in this field exceed several times those of Shatlyk which has worked so well. Construction of six producer wells has now been completed in Dauletabad, and eight more are being drilled. The brigade of experienced fireman A. Magomedov has worked especially well. It finished drilling the shaft with a record speed for this area, 753 m per machine per month.

The riches of the depths of Turkmenistan are the property of all the multinational Soviet people. Practically the entire country is helping us to develop them. We are assured that the important frontier planned in the decisions of the 26th CPSU Congress, to bring the gas extraction in the republic to 81-83 billion m<sup>3</sup> by the end of the five-year plan, will be reached.

9035

CSO: 1822/131

## FUELS

### RECONSTRUCTED BAKU PLANT PRODUCES MORE OIL DRILLING EQUIPMENT

Ashkhabad TURKMENSKAYA ISKRA in Russian 30 Mar 82 p 1

[Article by O. Bagirov, milling machine operator of Kishlinskiy Machine Construction Plant, deputy of the USSR Supreme Soviet, member of the Azerbaijan Communist Party Central Committee Office: "Arsenal of the Turkmen Oil Workers"]

[Text] The Kishlinskiy Machine Construction Plant has sent a large batch of units for underground repair of oil and gas wells ahead of schedule to the eastern shore of the Caspian, to the oil workers of fraternal Turkmeniya. These units were installed on powerful KrAZ-all-terrain vehicles and caterpillar tractors.

The self-propelled repair equipment was made with regard for those severe natural conditions in which it has to operate at the Turkmen oil fields. The machines can get to the boreholes which require repair without roads, through sand drifts and salt marshes. In order to facilitate the work of the drivers and operators, the cabs are equipped with reliable insulation.

The brand "KMZ" is on each unit. Although this is the firm symbol of our plant, it does not at all mean that the machine was made by the forces of only the Azerbaijan machine builders. Of course, it was designed and assembled in Baku. But the assemblies and parts for each unit were obtained from a hundred cities in the country located in all the union republics.

The all-union industrial association "Soyuzneftemash" of which our plant is a member, now manufactures two-thirds of all the domestic equipment for oil and gas extraction. Thirteen plants of the association and two scientific research institutes are working for the technical arsenal of the Soviet oil workers.

The Baku machine builders are now producing about 500 types of oil field equipment. Part of it goes to the Turkmen oil workers. This modern oil equipment includes rocker machines, gusher fittings, units of exploratory drilling, anti-emission equipment and drilling locks. In order to fabricate all of this, we in turn obtain the set-forming items and materials from almost 300 cities.

Now, as stipulated by the decisions of the 26th CPSU Congress, the plants of our sector are undergoing radical reconstruction. During the year which has passed since the congress, the Baku machine builders have increased the volume of production by more than one-third. During this time, about a hundred new

technological processes have been introduced, and dozens of automatic mechanized production lines and production sections have been started up. The equipment and the fittings for them were again obtained from many industrial centers in the country.

In the anniversary year, the enterprises are faced with important tasks. They must put into operation new shops, and master the industrial production of a number of new types of machines and units. A schedule has been worked out for a step-by-step introduction of the facilities. The collectives of the enterprise are struggling for accurate observation of this schedule. The result of participating in the technical re-equipping has become one of the important indicators for socialist competition for a worthy meeting of the 60th anniversary of formation of the USSR.

"Soyuzneftemash" will increase the production of equipment for the fuel and energy complex of the country by 1.5-fold by 1985. At the end of the five-year plan, our plants will produce as many items per month as they did for all of 1960. In order to attain these results, they would have to build several large enterprises which would cost the state a lot more than the reconstruction of the existing plants.

9035

CSO: 1822/131

## FUELS

### WORK OF TURKMEN GEOLOGISTS DESCRIBED

Ashkhabad TURKMENSKAYA ISKRA in Russian 4 Apr 82 p 2

[Article by M. Mirzakhanov, chief geologist of the TSSR Administration of Geology, honored geologist of the republic: "Explorers of the Underground Wealth"]

[Text] Geologists by right are called the explorers of the depths. They set aside landmarks for future fields, extracting complexes and gas pipelines, and make a great contribution to the development of our industry. In fulfilling the decisions of the 26th CPSU Congress and the 22nd Turkmen Communist Party Congress, the Turkmen geologists have successfully coped with their difficult and very important work on geological study of the territory, increase in the explored reserves of mineral and raw material resources, and primarily fuel and energy resources.

The plans of last year and the first quarter of the current for the increase in explored reserves of natural gas, sulfur, and confirmation of the reserves of explored fields of various minerals have been overfulfilled. The additional increment in gas reserves was 24 billion m<sup>3</sup>, and gas condensate 5.875 million T.

Enormous gas reserves have been explored close to the Shatlyk gas field, at the Dauletabad-Donmezskiy field, near the active Central-Asia-center of the country gas pipeline. This field is unique in reserves, scale and type of blue fuel deposits.

A broad complex of studies to reveal and prepare for exploratory drilling the promising areas has been made on the territory of the West Turkmen lowland, in the southern part of Central Karakumy and in the eastern regions of the republic. As a result, the assignment for preparation of structures which are promising for oil and gas for deep drilling has been overfulfilled.

The explored reserves of sulfur have increased for the Gaurdak Sulfur Plant imeni 50th Anniversary of the TSSR. New sections have been found in the operable Gaurdak field and the Kugitangdar'ya River valley. A final estimate will be made this year of the resources and the possibility will be defined of industrial development in the near future of the Karlyuk-Kizyltumshutskiy sulfur field. A state commission has confirmed the reserves of gypsum. Together with sulfur, anhydrite, potassium and rock salts, as well as limestone for soda production, these form the set of mineral resources of the Gaurdak field.



Work is continuing in the Gaurdak-Kugitanskiy mining region for preliminary exploration of the celestine field of Sakyrta. It has been established that the raw material here is not inferior in quality and reserves to the known Arikiski field.

The conditions and reserves of bentonite of the Oglanlinskiy field were also confirmed last year. The explored reserves of bentonites here increased by 2.6 million T. Exploration is underway for different types of minerals for the construction industry. In the Tashauzskaya Oblast, for example, reserves of sandy-shale rock and loam have been explored and confirmed in the Kernayskiy field which has already been transferred to industrial development. Detailed exploration is being finished up of the Geok-Tepinskiy field of limestone which is suitable for facing buildings and architectural groupings.

New manifestations of minerals have been discovered. A geological map has been compiled, the basis for scientific forecasting of the fields. Hydrological-geological and engineering-geological work has been done which is aimed at solving the most important task, the best provision of water to the cities and villages. Two fields of mineral water have been found and the republic national economy has been given 12 water wells.

In the last two five-year plans, the geological explorers have solved a number of serious problems to find and prepare promising areas for oil and gas in the west of the republic. Over 40 areas have been prepared for deeply occurring deposits in the West Turkmen lowland and the Mesozoic complex of West Kopetdag. There is no doubt as to their promising future. Deep drilling of these areas would guarantee the planned increase in oil and gas reserves in this region.

An enormous army of explorers of the depths is toiling on the vast spaces of the republic. Despite the complicated working conditions, the people have been models of true heroic labor. According to the results of the all-union and republic socialist competition, the collective of the oil exploration expedition was announced the winner last year and was awarded the challenge Red Banner of the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU and the Komsomol Central Committee, and the Turkmen geological exploration expedition was awarded the challenge Red Banner of the Turkmen Communist Party Central Committee, the TSSR Council of Ministers, the Turkmen Republic Council of Trade Unions and the Turkmen Komsomol Central Committee. The collective of the Kugitanskiy geological exploration expedition was awarded the challenge Red Banner of the USSR Ministry of Geology and the trade union central committee of the sector.

It is impossible not to make note of the work of the leading drilling brigades, the winners of the competition of B. A. Batyrov and A. Kuvanchev from the oil exploration expedition, Kh. Kul'metov from the Kugitanskiy geological exploration, and A. Ashirov from the Nebit-Dag geological exploration expeditions, and many others who coped ahead of schedule with the program of the first quarter and prepared a worthy gift for their professional holiday.

A lot of merit for effective resolution of the national economic tasks set before the Administration of Geology goes to the geologists and geophysicists

A. A. Nikolayev, Z. D. Kuliyeu, A. G. Yeziashvili, S. I. Trofimova, A. D. Dorovskiye, Ye. I. Mal'tsev, V. P. Vydumkina, S. Ismatov and others.

If we speak about the components of success, then it is determined a lot by the atmosphere of creativity which is inherent to geological exploration as a whole, no matter which direction of work we are speaking of. The technology, equipment and production processes are being intensively improved.

The explorers of the depths are now bearing an intensive labor watch in honor of the 60th anniversary for formation of the USSR. There is a lot of work ahead: they are faced with fulfilling a volume of geological exploration totalling R 85 million. They will continue to search for gas deposits in the regions of Central and East Turkmeniya, complex geological studies and parametric drilling in order to reveal and prepare different types of promising structures, primarily in the regions of the active territorial-production complexes.

The work which remains to be done this year can be compared to a mass attack whose main goal is to multiply the wealth of our motherland even more.

In the photograph: drilling foreman G. P. Shevchenko, head of the central engineering and technical service A. P. Sedov and head of the borehole V. N. Mel'nikov from the Anauskiy oil exploration expedition of the Turkmen SSR Administration of Geology.

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May 26, 1982